

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Previously Presented) A semiconductor photo-detector, comprising:

an intrinsic or a first conduction type semiconductor layer, a photo-absorption layer comprising a superlattice semiconductor layer or a multiple quantum well semiconductor layer, and a schottky electrode which are disposed on a substrate having a top surface and an end surface meeting at an edge;

said photo-absorption layer being spaced from said edge of said substrate adjoining said end surface;

a semiconductor multilayer structure of large schottky-barrier height having a schottky barrier higher in schottky barrier height than a schottky barrier between said photo-absorption layer and said schottky electrode being formed between said photo-absorption layer and said schottky electrode; and

a light incident facet on said end surface forming an acute angle with said top surface, wherein incident light is refracted at said light incident facet and transits said photo-absorption layer at an angle with respect to an orthogonal of said photo-absorption layer.

5. (Original) The semiconductor photo-detector as claimed in claim 4, wherein said semiconductor layer of large schottky-barrier height comprises $\text{In}_{1-x-y}\text{Ga}_x\text{Al}_y\text{As}$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$).

6. (Original) The semiconductor photo-detector as claimed in claim 4, wherein said semiconductor layer of large schottky-barrier height comprises $\text{In}_{1-x-y}\text{Ga}_x\text{Al}_y\text{As}$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$) and thin $\text{In}_{1-u}\text{Ga}_u\text{As}_{1-v}\text{P}_v$ ($0 \leq u \leq 1$, $0 \leq v \leq 1$) disposed thereon.

7. (Previously Presented) The semiconductor photo-detector as claimed in claim 4, wherein a compositionally graded or step-graded layer from the same composition as said photo-absorption layer to the same composition as said semiconductor layer of large schottky-barrier height is disposed between said photo-absorption layer and said semiconductor layer of large schottky-barrier height.

8. (Previously Presented) A semiconductor photo-detector, comprising:
a substrate having a top surface and an end surface meeting at an edge;
a photo-absorption part comprising a semiconductor multilayer structure including a photo-absorption layer provided on said top surface of said substrate and spaced from said edge;
a light incident facet on said end surface forming an acute angle with said top surface; and
a V- or U-shaped groove opposed to said light incident facet,
wherein incident light from an optical fiber disposed in said groove is refracted at said light incident facet and transits said photo-absorption layer at an angle with respect to an orthogonal of said photo-absorption layer.

9. (Previously Presented) The semiconductor photo-detector as claimed in Claim 8, wherein said light incident facet and said V- or U-shaped groove are fabricated simultaneously by etching.

10. (Original) The semiconductor photo-detector as claimed in claim 8, wherein said light incident facet and the vicinity thereof are buried in an organic substance.

11. (Cancelled)

12. (Cancelled)

13. (Previously Presented) A semiconductor photo-detector, comprising:
a substrate having a top surface and an end surface meeting at an edge;
a photo-absorption part comprising a semiconductor multilayer structure including a
photo-absorption layer provided on said top surface of said substrate;
a light incident facet on said end surface forming an acute angle with said top surface;
said end surface including an abutting surface positioned below and spaced laterally from
said light incident facet and said edge for receiving an optical waveguide to contribute to
precisely positioning said optical wave guide; and
incident light from said optical waveguide being refracted at said light incident facet and
transiting said photo-absorption layer at an angle with respect to an orthogonal of said photo-
absorption layer when introduced to said light incident fact.

14. (Previously Presented) A semiconductor photo-detector, comprising:
a substrate having a top surface and an end surface meeting at an edge;
a photo-absorption part comprising a semiconductor multilayer structure including a
photo-absorption layer provided on said top surface of said substrate;
a light incident facet on said end surface forming an acute angle with said top surface; and
an upper layer over said photo-absorption layer in said photo-absorption part being
terminated with a substance having a smaller refractive index than a semiconductor layer,
wherein incident light is refracted at said light incident facet and transits said photo-
absorption layer at an angle with respect to an orthogonal of said photo-absorption layer such that
said transit light is totally reflected by said smaller refractive index substance terminating said
upper.

15. (Cancelled)

16. (Original) The semiconductor photo-detector as claimed in claim 5, wherein a compositionally graded or step-graded layer from the same composition as said photo-absorption layer to the same composition as said semiconductor layer of large schottky-barrier height is disposed between said photo-absorption layer and said semiconductor layer of large schottky-barrier height.

17. (Original) The semiconductor photo-detector as claimed in claim 6, wherein a compositionally graded or step-graded layer from the same composition as said photo-absorption layer to the same composition as said semiconductor layer of large schottky-barrier height is disposed between said photo-absorption layer and said semiconductor layer of large schottky-barrier height.